Declining Water Levels in the Apalachicola River and Impacts on Floodplain Habitats

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Water levels in the Apalachicola River upstream of tidal reaches have decreased significantly in the past 50 years. Most of the declines are due to channel deepening and widening from dams and navigational improvements on the river, which have lowered river stages throughout most of the river by 2-5 feet. Channel deepening occurred because sediments were trapped in Lake Seminole and other reservoirs upstream, and sediment-starved water scoured the riverbed downstream of Jim Woodruff Dam. Channel widening was caused by a variety of impacts that probably include bank failure associated with riverbed scour, dredging, dredge material disposal, woody debris removal, and other navigational improvements. Flows may also be declining, as preliminary analyses indicate that during periods of low rainfall, less flow reaches the Apalachicola River now than it did several decades ago. Decreased flows that cannot be accounted for by climatic changes may be caused by changes in anthropogenic activities such as water consumption and reservoir evaporation.

Declining river levels have resulted in substantially drier conditions in nontidal floodplain habitats. Most of the floodplain is presently experiencing flood durations that are 5-25 percent less than they were prior construction of Jim Woodruff Dam in the mid-1950's, with the most affected areas suffering declines in flood duration of 40-50 percent. During dry periods in recent decades, over 200 miles of floodplain sloughs, streams, and lakes had shallower water depths or were disconnected from the main channel longer than in dry periods prior to 1955. These off-channel habitats are critical to Apalachicola River fish species, 85 percent of which use the floodplain at some time in their life cycle. The nontidal floodplain forest, covering 82,000 acres, is one of the largest and most valuable wetland resources of the State of Florida. A decline in water levels can change floodplain forest vegetation over time by favoring species that are adapted to drier environments, opportunistic species, or invasive exotics.

Protection efforts should address decreases in water levels from channel changes and decreases in flow from upstream consumption and evaporation. A better understanding of sediment transport and river morphology dynamics is needed to develop recommendations for slowing the rate of channel widening and bed degradation. Quantitative descriptions of the potential impacts of flow reductions on biological habitats are also important, so that a reasonable balance can be achieved between upstream water management and downstream ecological flow needs in water allocation negotiations.